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the lead must then be turned over the heads of the pins, which forms the skeleton of the type, as shown in the half mould, fig. 6. When placed in the mould, a small square rim, *s s* fig. 10, is sprung into the chamber upon the pasteboard, to keep it steady. Care should be taken that the type is quite upright in the mould, and sufficient room left for the metal to surround it. The metal used for this purpose is composed of eight parts Bismuth, five of lead, three of tin, which is fusible in boiling water, as metal which requires a greater heat would tend to soften the pins. The mould should be set upon sand to be filled with the metal. The impressions for the tops are raised with punches upon lead; the type to be filed or made even, and the letter cemented on with gold size, or any other cement.

Fig. 11 is a side view of the types when finished; they are all notched as at *t*, to distinguish the top from the bottom of the letter.



IV.—ICE SAW.

The LARGE SILVER MEDAL was this Session presented to W. J. HOOD, Esq. Sen. Lieutenant, H. M. S. Hyperion, for an ICE SAW; a Model of which has been placed in the Society's Repository.

SIR;

Newhaven, Sussex, March 6, 1827.

In reply to your letter of yesterday's date, I have to avail myself of the occasion of a friend going to town, to forward a drawing of a saw and frame for cutting through ice, and as I deem the invention to be a decided improve-

ment on that of the common method now in use by our Greenland vessels, and others accustomed to the necessity of its use. I beg to lay it before the public, through the medium of the Society, trusting that the same will be found useful.

I am, Sir,

A. Aikin, Esq.

&c. &c. &c.

Secretary, &c. &c.

W. J. S. Hood,

Sen. Lieut. H. M. S. Hyperion.

SIR;

London, March 22, 1827.

My last letter, dated from on board His Majesty's Ship Hyperion on the 10th instant, claimed the favour of being allowed an opportunity of laying before a Committee of Mechanics a saw calculated to cut through ice with much fewer hands than is usually employed by our Greenland and Northern trade, when requiring the same; and as my stay in town is limited, by my presence being required at an early period on board, I have to hope that I may be allowed an early opportunity to explain the nature of the improvement. I subjoin a few remarks relating to the same.

I am, Sir,

A. Aikin, Esq.

&c. &c. &c.

Secretary, &c. &c.

W. J. S. Hood,

Sen. Lieut. H. M. S. Hyperion.

The common method now practised by our Greenland ships, and those connected with our Northern trade, when they have to cut through ice, is, to suspend a saw with a weight attached (similar to that represented in Plate V), from a triangle formed of three spars, with a block at the

fork, through which a leading rope is rove, to run it up and down. It is obvious that this rope will require ten or twelve men, and that to follow up the cut, four or five more must be stationed at the lower end of each spar, to carry the whole forward, making an aggregate of twenty-five to thirty.

By adopting the plan proposed by me, and shown in the model, the saw is constantly kept at its work. It will be seen, that the first and second position of the propeller only goes over a space equal to the versed sine of the arch made by the angle of elevation, which is equal to the cut.

The saw, after once being entered in the ice, will only require from two to four men to work it; and it need not be taken out of the ice till after the distance required to be cut through is accomplished. The saw can be guided by the lever in any direction, so as to cut the ice into pieces most convenient for removal, either by pushing them under the adjacent floor of ice, or by dragging them out of the ship's track to clear water.

Reference to the Engraving.—Plate V.

Fig 1, *a a a a a* a sledge of open frame work, resting on the surface of the ice *x x*; *b* a transverse bar, passing through the lever *c c*, and forming the fulcrum on which it moves; *d* the handle of the lever; *e* a clamp or brace, consisting of two cheeks, one on each side of the lever, loosely pinned at top to the lever, and at bottom to the saw *f*; *g* a clamp similar to *e*, by which the weight *h* is hung to the lower end of the saw; *i* the propeller, an iron bar, terminating below in two claws, and at top in a fork, and suspended on the lever by means of a transverse pin *k*; *l* a weight, hung to the propeller at *m*;

n a transverse bar, limiting the motion of the handle end of the lever in an upward direction.

Figs. 2 and 3, *o o* two upright bars between which the handle end of the lever moves, and which therefore prevent it from swerving laterally.

V.—IMPROVED LOG-SHIP.

The LARGE SILVER MEDAL was this Session given to Mr. JAMES HOOKEY, Midshipman, for his IMPROVED LOG-SHIP, a Model of which has been placed in the Society's Repository.

SIR ;

I SHALL feel particularly obliged by your laying before the Society of Arts, &c. a log-ship invented by my son, James Hookey, Admiralty midshipman on board his Majesty's ship *Barham*, recently sailed for the West Indies, with an improvement in the log and lead lines.

The advantages gained by this invention are, that it gives the distance the ship runs more correctly, as it remains more stationary in the water than the one now in use ; and when required to be hauled into the ship, by giving it a sudden jerk, the toggle swivels round, and disengages the line from the spring, in consequence of which, the log-ship reverses its position, and may then be pulled into the ship with the greatest ease.

With respect to the lines, he recommends that they be saturated in a composition of oil, which makes them more buoyant and pliable, and prevents kinking ; it likewise prevents their contracting, which in new line is about twenty feet in fifty fathoms.

As many serious accidents are likely to occur by getting a false depth of water, in consequence of the contraction